SYNOPSIS OF THESIS
DOCTOR OF PHILOSOPHY (Ph.D.) IN CLINICAL PSYCHOLOGY
SUBMITTED TO RANCHI UNIVERSITY, RANCHI

SESSION: 2022-2024

"Efficacy of Brief Integrated Schema and Mindfulness-Based Intervention Module on Improving Social Cognition in Adolescents with Internalizing Behavioural Problems: A Psychophysiological Study"

Under The Joint Guidance Of

Dr. Mahashweta Bhattacharya, M.Phil., Ph.D.
Assistant Professor of Clinical Psychology
Central Institute of Psychiatry, Ranchi

&

Dr. Avinash Sharma, M.D., FRANZCP
Associate Professor of Psychiatry
Central Institute of Psychiatry, Ranchi

By
Ms. Debaleena Ghosh, M.Phil.

DEPARTMENT OF CLINICAL PSYCHOLOGY
CENTRAL INSTITUTE OF PSYCHIATRY, RANCHI

STATE OF ART:

Adolescence is a period of physical, psychological, and social transition between childhood and adulthood (Spear, 2000). While the exact beginning and end of adolescence are difficult to pinpoint, it has been suggested that they coincide with the onset of puberty and a stable commitment to an adult role, respectively (Damon, 2004). Adolescents at this stage seek their true selves and identities, the transition from individual to group trends, seek consistency in their behaviour, and attempt to control these various changes. Simultaneously, adolescents must adapt to various significant physical, intellectual, social, and emotional changes, as well as the demand for social approval, identity, and affect from peers. Thus, adolescence is probably the most difficult stage of the life cycle in terms of emotional and developmental complexity (Livesey & Ronstain, 2017).

It is indeed important to consider the role of social cognition in adolescence. The social environment significantly impacts the development of the adolescent brain (Blakemore, 2008). Also significant is adolescents' increasing ability to think abstractly about themselves and others. Recent advances in brain imaging have enabled an increased understanding of the structural and functional changes that occur in the human brain during this developmental period (Blakemore & Mills, 2014; Casey et al., 2008; Ernst & Fudge, 2009; Lenroot & Giedd, 2006), as well as how these changes relate to social cognitive development.

In its broadest sense, social cognition refers to any cognitive process involving other individuals. It has been described as “the ability to construct representations of the relations between oneself and others, and to use those representations flexibly to guide social behaviours, and defined as “the mental operations that underlie social interactions, including perceiving, interpreting, and generating responses to the intentions, dispositions, and behaviours of others” (Adolphs, 2003; Brown et. al., 2012; Green et al., 2008). Thus, social cognition plays a crucial role in successfully negotiating complex social interactions and decisions (Crone, 2013).

Epidemiological evidence suggests that adolescence is also a critical period for the onset of psychological disorders (Kessler et al., 2005). Adolescent psychiatric conditions involve significant changes in the way they generally learn, behave, or handle their emotions, causing distress and difficulties getting through the day. A mental health problem is defined as a "disruption in functioning" in areas such as relationships, mood, behaviour, or self-development that is particularly severe or persistent over time, or when several of these difficulties occur at the same time (John et al, 2005). According to a meta-analysis, 6.5% of community samples and 23.3% of school samples exhibited significant mental health morbidity (Malhotra & Patra, 2014). Issues of mental health are the primary

cause of years lived with disability (YLD) among adolescents and young people (10 to 23 years old), accounting for 22.9% of total global YLDs (Whiteford et al., 2013).

In accordance with Achenbach's conceptualization (1991), disorders of adolescence may be categorized as internalizing behavioural problems which include conditions like depression and anxiety, problems of withdrawal, and somatic complaints (e.g., fears, concerns, headaches, and stomachaches) (Merrell, 2008; Plenty et al., 2014); and externalizing behavioural problems which include disruptive behaviours, hyperactive and aggressive behaviours as well as conduct problems. It has been proposed that this vulnerability stems from continual brain development during adolescence, specifically in brain regions responsible for high-level cognitive processes like planning, decision-making, and emotion regulation (Paus et al, 2008) and most importantly several socio-cognitive processes.

Various facets of social cognition are impaired in internalizing behavioural problems. Although the diagnostic criteria for internalizing behaviours do not reflect specific social skills deficits, research indicates that these deficits are highly prevalent. Moreover, theories propose direct links between social skill impairments and internalizing illnesses (Rudolph, 2009). Interpersonal theories of depression, for example, focus on the difficulty that individuals with internalizing behaviours have in seeking and getting enough support from others (Coyne, 1976; Joiner et al, 2009).

Impairment in social cognition and social cognitive biases exhibited in internalizing behavioural problems are rooted in self-defeating emotional and cognitive patterns that start early in childhood development and persist throughout life, referred to as Early maladaptive schemas. (Young, 1990, 1999). Early maladaptive schemas have implications in terms of information processing, with selective filtering of corroborating information and dismissal of contradictory information (Beck, 1976; Beck et al, 1991; McGinn & Young, 1996; Schmidt et al, 1995). Scanning for evidence and dismissing contradictory facts serve to maintain the schemas throughout one's life and relationships.

Internalizing behavioural problems in adolescence have been treated using a variety of therapeutic approaches. The three most notable ones are cognitive-behavioural therapy, family therapy, and psychoanalysis. Schema therapy is one of the novel treatments that have emerged from the cognitive behaviour therapy (CBT) paradigm. Jeff Young expands on "conventional" CBT while also referencing a long history of alternative psychotherapeutic modalities (Young et al, 2003). Schema therapy incorporates theories and techniques derived from cognitive-behavioural therapy, interpersonal psychotherapy, Gestalt therapy, psychodynamic therapy, and attachment theory (Van Genderen & Arntz, 2009; Van Vreeswijk et al, 2012; Young et al., 2003).

The practice of mindfulness-based interventions has also gained popularity in recent decades. Mindfulness is the practice of directing attention in a particular way. It involves "awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 2003) which can be cultivated and developed through meditation practice. Within clinical and educational contexts, the use of mindfulness-based therapies for adolescents is rising rapidly. In addition to improving functioning and skills in attentional focus and concentration, emotion regulation, social and academic performance, adaptive coping, frustration tolerance, self-control, and self-esteem, proponents emphasize benefits in reducing a wide spectrum of psychopathology, including internalizing and externalizing behaviours. In addition, empirical literature also suggests that mindfulness can be used as a major role in enhancing several aspects of social cognition including empathy, together with compassion and prosocial behaviour (Luberto et al., 2018). To this end, mindfulness-based interventions may be desirable and helpful beginning in early childhood and adolescence to encourage healthy development, prevent expected setbacks, or lessen the effects of existing illnesses or impairments.

Individually, both therapies have found wide acceptance in terms of therapeutic application in internalizing disorders. However, using an integrative approach of schema and mindfulness-based therapy is still an underexplored area of research. An integrated intervention module involving both components can prove to be a comprehensive method of addressing the problems in a holistic yet flexible manner. Schema Therapy works in two stages: the assessment stage, in which schemas and modes are identified; and the transformation stage, in which empathic confrontation and reality testing are employed toward the transformation of schemas and modes. Techniques from cognitive-behavioural therapy (cognitive reorganization, development of an internalized healthy voice, and behavioral exercises intended to disrupt dysfunctional behaviour) as well as experiential therapy (practising expressing anger, sadness, or pain), Gestalt therapy, and interpersonal psychotherapy techniques are used to change schemas and modes. The mindfulness-based approach introduces the third element of change by paying non-judgmental attention to the internal experience of schema and mode activation, space is made available for creative and proficient ways of responding to the environment.

REVIEW OF LITERATURE:

Social Cognition: Conceptual Clarification

Throughout the study literature, various researchers frequently use the same terms to refer to various aspects of social cognition in different ways. Empathy is the capacity to experience other people's

emotions. The theory of mind (TOM), on the other hand, is frequently used to emphasise the notion that humans typically have extensive metacognitive understandings of both our own minds and the minds of others—including both cognitive and affective components. Similar to this, Frith and Frith (1999) coined the term "mentalizing" to express the notion that when we have a well-developed theory of mind, we see both ourselves and others as subjective beings with mental states in addition to being sensory objects.

Social cognition is the process through which children and adults understand how they and others think, feel, perceive, imagine, react, ascribe, infer, and so forth (Franco 1997; Walker-Andrews 1997). It is thus a multidimensional psychological concept comprising several subdomains and processes that facilitate social interaction, such as knowledge about the self, perception of others, and interpersonal motivations. The National Institute of Mental Health (2006) identified five areas of social cognition: emotion processing, theory of mind, attributional bias, social perception, and social knowledge.

The neurological underpinnings of social cognitive processing are intricate, encompassing a variety of cortical and subcortical regions and connective pathways (Van Overwalle, 2009). This "social brain" network varies depending on the task requirements, but it is generally believed to consist of limbic areas (such as the amygdala), the prefrontal cortex and temporoparietal junction, as well as the anterior cingulate and insular cortex (Forbes & Grafman, 2010, Lavin et al., 2013, Lindquist et al., 2012, Molenberghs et al., 2016). According to several studies (Patriquin et al., 2016, Seeley et al., 2009), social cognitive impairment may be prevalent across clinical populations. Many of these regions are negatively impacted in people with neurological or psychiatric conditions.

Social Cognition in Adolescence

Large-scale MRI studies that examined brain development across the lifespan have revealed that social cognition-related brain regions continue to develop slowly throughout adolescence. (Sowell et al., 1999; Gied et al., 1999; Gogtay, 2004., Shaw et al., 2008) Gray matter grows in bulk in the frontal and parietal lobes during childhood, peaking at the start of puberty. Gray matter begins to thin over the remaining years of adolescence after that. In contrast, the peak grey matter volume in the brain's core sensory regions is reached during childhood (Blakemore, 2008; Paus, 2008).

According to some theories, synaptic proliferation (also known as synaptogenesis) is what causes the regional increases in grey matter volume up to and around puberty, and the subsequent grey matter thinning represents the "pruning" or removal of synapses. (Huttenlocher et al., 1979, 1982, 1997) These modifications should lead to brain circuits that are more tuned and respond to the task at hand. The prefrontal cortex, a part of the brain involved in higher cognitive functions like social cognition

and the planned regulation of behaviour, is one of the brain areas that experience significant changes in gray matter during the adolescent years. This implies that the high-level skills incorporated by these late-maturing regions can still be evolving during adolescence.

Adolescent mental health and role of Social Cognition:

Mental Illness: Definition:

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 2013) defines a mental disorder as 'a syndrome characterized by clinically significant disturbance in an individual' s cognition, emotion regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. They are usually associated with significant distress or disability in social, occupational, or other important activities.'

Baker and Cantwell (1987) provided a working definition of psychiatric disorder suggesting it to be 'a disorder of behaviour, emotions or relationships that is sufficiently severe and/or sufficiently prolonged, to cause disturbance in the child or disruption of his immediate environment'

Adolescent mental health problems are often categorised as either 'internalising' or 'externalising' (Fish & Shapiro, 1964). In accordance with Gray's (1981, 1987) neuropsychological model of brain functioning, internalising and externalising difficulties have been defined as the inhibition and facilitation of behaviour, respectively. Behaviour is thought to be the outcome of two distinct brain systems: a Behavioural Activation System (BAS) that generates appetitive and aggressive behaviour and is reward sensitive, and a Behavioural Inhibition System (BIS) that mediates inhibition of behaviour in novel situations and in the presence of cues signalling impending punishment. A BIS that is more active than the BAS increases the likelihood of inhibition of behaviour. A more active BAS than a BIS will induce behaviour to be initiated more easily (Kooijmans et al., 2000; Quay, 1988, 1993, 1997).

Internalizing Behavioural Problems: Adolescents with internalising difficulties exhibit inhibited and over-controlled behaviours, which reflect the child's internal distress (e.g., anxiety and depression). They may have a nervous or anxious temperament and be apprehensive, afraid, and/or withdrawn (Oldehinkel et al., 2004). Internalized failures of emotion control might manifest as rumination, panic, self-criticism, social inhibition, interpersonal isolation, concentration difficulties, and attention problems (Barlow et al., 2004; Eisenberg et al., 2001).

Since it has been established that various facets of social cognition are impaired in child and adolescent psychopathology, these disorders incorporate them into their treatment plans. Internalizing symptoms

are linked more strongly to social-cognitive biases toward oneself and others (Bradley & Mathews, 1983), a higher level of experiential avoidance (attempts to avoid thoughts, feelings, memories, physical sensations, and other internal experiences) (Venta et al., 2012).

Role of Early Maladaptive Schemas in Social Cognitive Deficits in Internalizing Behavioural Problems

The history of the word "schema" in psychology is very extensive, being used mostly in the context of cognitive development. A schema is a pattern that is imposed on reality or experience to aid explanation, mediate perception, and direct reactions in cognitive development. A schema is an abstract representation of an event's distinguishing characteristics, a kind of blueprint of its key components. Beck (1967) made use of schemas in his early writing as he transitioned from cognitive psychology to cognitive therapy. A schema, however, can be conceptualised broadly as any broad organising principle for making sense of one's life experience in the context of psychology and psychotherapy. The idea that schemas, many of which are formed early in life, continue to be developed and then superimposed on later life experiences, even when they are no longer applicable, is a significant idea having implications for psychotherapy. This is frequently referred to as the requirement for "cognitive consistency," which is the ability to maintain a constant perception of oneself and the outside world, despite the fact that it is unreliable or distorted in actuality. By this broad definition, a schema can be either positive or negative, adaptive or maladaptive; schemas can be created in adolescence or later.

Young (1990, 1999) proposed that some of these schemas may be at the root of personality disorders, more manageable characterological issues, and many chronic Axis I disorders, particularly schemas that arise predominantly as a result of toxic childhood experiences. He identified a group of schemas that he termed Early Maladaptive Schemas in order to investigate this theory. A revised, comprehensive definition of an Early Maladaptive Schema is:

• a broad, pervasive theme or pattern

• comprised of memories, emotions, cognitions, and bodily sensations

• regarding oneself and one’s relationships with others

• developed during childhood or adolescence

• elaborated throughout one’s lifetime and

• dysfunctional to a significant degree

Early maladaptive schemas are, in a nutshell, self-defeating emotional and cognitive patterns that start early in our development and persist throughout life. The way a person behaves is not a function of their schema; according to Young, maladaptive behaviours arise in reaction to a schema. Therefore, although behaviours are not part of schemas, they are driven by them.

A growing body of research shows links between Young's (1994) early maladaptive schemas (EMS) and subsequent emotional and behavioural issues in adolescents (Calvete and Orue 2012; Muris 2006; Van Vlierberghe and Braet 2007; Van Vlierberghe et al. 2010). EMS are recurring, counterproductive patterns made up of thoughts, feelings, memories, and bodily responses (Young 1994). They emerge in early life as a result of the interaction between the child's innate temperament and unfavourable childhood circumstances. The processing of social information by EMS is biased, leading to unfavourable emotions and dysfunctional thoughts that may eventually internalize and externalize behavioural issues.

The theory of Social Information Processing (SIP) (Crick & Dodge, 1994) is a well-known theory to explain internalizing and externalizing behavioural problems in children and adolescents. This theory states that in ambiguous social situations, children and adolescents with externalising behavioural problems engage in a series of biases in information processing: hypervigilance to hostile cues, hostile attribution of others' intent, hostile goal selection, hostile solution generation, hostile anticipation of favourable outcomes for aggressive responses, and hostile behaviour enactment. Lemerise and Arsenio (2000) expanded on the preceding model by including additional emotional elements, such as the belief that the other person is happy about what occurred, one's own anger, and deficiencies in one's ability to regulate emotions. On the other hand, adolescents exhibiting internalizing problems engage in the following biases of attention to negative stimuli in the encoding of information, greater threat perception, depressogenic attributional style, cognitive biases in the interpretation of social events, over-general autobiographical memory, rumination, and decision-making. The theory hereby brings out the interplay between social cognition and developmental psychopathology, highlighting the unique patterns of social cognitive processing in different adolescent psychiatric conditions. This implies how basic social cognitive deficits may result in later cognitive interpretive biases, thus linking the deficit model of social cognition with the cognitive biases approach to social cognition.

Cognitive models propose that cognitive schemas act as deep structures that influence cognitive processes (Beck, 1976). Thus, biases in social information processing and deficits in social cognition can be linked to deeper schemas. Van Vlierberghe and Braet (2007) discovered that the EMS Social isolation (the idea that one would never fit in) and Vulnerability to harm/illness explained 45% of the variance in internalising difficulties. Additionally, they discovered that EMS Entitlement/grandiosity

and Dependence/incompetence (the conviction that one is unable to manage daily obligations without assistance) accounted for 19% of the variance in externalising difficulties. Other research (Muris 2006; Van Vlierberghe et al. 2010) discovered sets of schemas that contributed specifically to specific sorts of issues, such as depressive symptoms, anxiety symptoms, and disruptive behaviours (explained variance ranged from 0.38 to 0.52). According to cognitive theories, EMSs tend to direct adolescents in ambiguous social situations in their perception of the intents and feelings of others, their own feelings, their decision of how to respond to the circumstance, and their appraisal of the selected response (i.e., the SIP components). These elements would serve as the close precursors to the resulting behaviour. In light of this, social cognitive and information processing serve as a mediator between schemas and general coping behaviours (Calvete & Orue, 2012; Zelli et al., & Conduct Problems Prevention Research Group, 1999).

Event-Related Potential and Social Cognition:

Event-related potentials (ERPs) are very small voltages produced in brain areas as a result of certain events or stimuli (Blackwood and Muir, 1990). They are time-locked EEG alterations to the sensory, motor, or cognitive events that provide a safe and non-invasive technique to studying psychophysiological correlates of mental processes.

The P300 is an important and extensively explored late component of ERPs that is widely applied to assess cognitive function in humans (Sutton et al., 1965). The amplitude and latency of the P300 component provides information about cognitive processes in the brain, such as memory, attention, concentration and speed of mental processing (Casali et al., 2016). Many previous studies have focused on the application of the P300 component in the assessment of cognitive impairment across psychiatric conditions.

The N170 component of ERP research—an early negative deflection prevalent over occipital-temporal scalp areas (especially on the right side)—responds specifically to faces and is thought to reflect the early configural/holistic encoding of a face in visual perception (e.g. Bentin et al., 1996; Eimer, 2000). According to research on the potential neuronal generator of the N170, it reflects numerous origins in the occipito-temporal area of the brain, one of which is thought to be the fusiform gyrus (Deffke et al., 2007). The N170 component is particularly interesting for the study of social cognition because it is thought to reflect the initial step of detecting that an object is a conspecific—the first stage of social perception.

Interventions for Internalising Behavioural Problems: An Update

Internalizing behavioural problems in adolescence and resultant biased social information processing, and deficits in social cognition have functional consequences such as academic failure, low social competence, increased delinquency, and poor social skills. Adolescent disorders have been treated using a variety of treatment approaches. The three most notable ones are cognitive-behavioral therapy, family therapy, and psychoanalysis. But the most popular and empirically well-supported therapeutic approach is cognitive-behavioral therapy.

Cognitive-behavioral treatments are based on the assumption that feelings and behaviors are the results of recognition. Cognitive-behavioral therapy contains the key elements of cognitive-behavioral theories and among them, Kendall's cognitive-behavioral treatment program (Coping Cat) is one of the pioneering therapeutic methods in the treatment of comorbid disorders in childhood. It was prepared based on theoretical concepts and research findings on common aspects of internalizing disorders (Zarghami et al., 2015). This program is implemented in 16 sessions for children and adolescents and it is applicable in individual or group forms. This is the first coherent step-by-step program designed based on a cognitive-behavioral approach to reduce anxiety in children and adolescents and numerous studies have confirmed its effectiveness (Kendall et al., 1997; Nauta et al., 2003; McNally et al., 2013). This intervention has two parts. The first 8 sessions of the therapeutic program include training in basic concepts and skills such as cognitive reconstruction, de-stressing, problem-solving, and self-rewarding. The second part of the treatment in the 8 sessions includes active engagement with skills learned in anxiety-inducing situations. This phase focuses on the child's exposure to the motivating position through the skills that the child has learned in the first 8 sessions. A review of the literature shows that cognitive-behavioural therapy has been approved as an effective treatment to reduce anxiety and internalizing disorders.

Schema Therapy and Mindfulness-based Therapy as Tools in Improving Social Cognition in Internalizing Behavioural Problems:

Schema Therapy has been shown to be successful in treating patients with personality disorders in a number of studies (Farrell et al. 2009; Giesen-Bloo et al., 2006; Nadort et al., 2009), both in samples that included patients with internalizing behavioural problems (Bamelis et al. 2014) and externalizing behavioral problems (Bernstein et al., 2012). Effectiveness of Schema therapy versus treatment-as-usual for Effect sizes for changes in EMS/schema modes and symptoms ranged from modest to big. Schema Therapy may be useful for adolescent patients with personality disorder symptoms,

internalizing behavioural problems, and externalizing disruptive behavioural problems, according to recent research (Roelofs et al. 2016).

Studies of mindfulness-based interventions for use with youth and adolescents are still emerging. Most of the extant empirical literature investigates the role of meditation practice and mindfulness (both state and trait) in the field of emotional processing, which is broadly defined as perceiving and using emotions, including recognition perception, understanding and managing emotions (Pinkham et al., 2014). Studies have shown the influence of long-term meditation practice on early emotional processing in the brain, indicating that long-term meditation practice enhances frontal top-down control over fast automatic detection of stimulus salience (Reva et al., 2015).

Additionally, there is evidence in respect of the impact of mindfulness on empathy (Birnie et al., 2010; Raab, 2014; Jones et al., 2016). More specifically, increased attention has been shown to enhance empathy, compassion, and prosocial behavior, indicating small-to-medium effects of meditation based on a systematic review and meta-analysis (Luberto et al., 2018). Furthermore, Ridderinkhof et al. (2017) investigated whether mindfulness meditation (5-min exercise) increased empathy, and they observed no effect of mindfulness relative to both control conditions (relaxation and mind-wandering) on mind reading (ToM), empathic responding, or prosocial behavior. The authors also found that mindfulness meditation improved mind reading (i.e., ToM) only in non-narcissistic people, questioning whether a brief mindfulness exercise would be sufficient for building empathy.

Another study revealed that brief mindfulness meditation (5-min mindfulness induction) enhanced both ToM and empathic concern, compared with the control group (Tan et al., 2014).

PROBLEMS TO BE INVESTIGATED:

The present research aims to study the efficacy of a Brief Integrated Schema and Mindfulness-based Intervention Module in adolescents with Internalizing behavioural problems and to assess the applicability of the module on social cognition, severity of their illness, early maladaptive schemas, mindfulness and global functioning.

OBJECTIVES OF THE INVESTIGATION AND MOTIVATION:

OBJECTIVES:

Primary Objectives:

- To assess the efficacy of Brief Integrated Schema and Mindfulness-based Intervention for change in social cognition in adolescents with Internalising behavioural problems as compared with adolescents receiving treatment as usual.

- To assess the efficacy of Brief Integrated Schema and Mindfulness-based Intervention for change in the overall severity of the symptoms in adolescents with Internalising behavioural problems as compared with adolescents receiving treatment as usual.

Secondary Objectives:

- To assess the efficacy of Brief Integrated Schema and Mindfulness-based Intervention for change in early maladaptive schemas in adolescents with Internalising behavioural problems as compared with adolescents receiving treatment as usual.

- To assess the efficacy of Brief Integrated Schema and Mindfulness-based Intervention for change in mindfulness in adolescents with Internalising behavioural problems as compared with adolescents receiving treatment as usual.

- To assess the efficacy of Brief Integrated Schema and Mindfulness-based Intervention for change in global functioning in adolescents with Internalising behavioural problems as compared with adolescents with Internalising behavioural problems receiving treatment as usual.

- To assess the efficacy of Brief Integrated Schema and Mindfulness-based Intervention on the electrophysiological measure in adolescents with Internalising behavioural problems.

- To assess the association of improvement in outcome variables with Brief Integrated Schema and Mindfulness-based Intervention with various Socio-demographic clinical variables in children and adolescents with Internalizing behavioural problems as compared to treatment as usual.

MOTIVATION:

The role of social cognition in the aetiology or development of internalizing behaviours in adolescence has already been emphasized. Social cognitive deficits may be the result of psychopathology and not the cause. Given their relatively remote relationship to mental processes of interest (Payne, 2001; Bartholow et al., 2009; Amodio and Mendoza, 2010), it is typically difficult to evaluate hypotheses about the mechanisms underlying social cognitive processes using just behavioural and task-based approaches. The National Mental Health Survey (2016) suggests the prevalence of mental disorders among children and adolescents as 7.3%. In the absence of adequate management, such psychological disturbance in a child or adolescent advances slowly into adult psychopathology. Adolescence is a time when internalizing symptoms typically manifest, and early intervention can help prevent the

emergence of more serious or persistent issues. Studies have shown behavior therapy results in superficial and short-term change and modification of behaviour in children. However, it appears that changes in schemas are deeper, more effective, and stable because they are part of a more complex mechanism that includes the body's reaction, thoughts, affections, and behavior, all of which lead to more expansive and stable changes. (Salgo et al., 2021) The integration of mindfulness-based interventions (MBIs) with traditional therapies has increased in a variety of clinical and institutional settings, but almost exclusively in adult populations. Only recently has the focus shifted toward the application of MBIs to children and adolescents. (Perrier et al., 2020) Also, there are limited research in India regarding the development of social cognition in Internalizing behaviours and application of schema and mindfulness-based interventions in this regard. Thus, this study would contribute in the following ways:

- It would help in examining social cognition in relation to internalizing disorders in adolescence emphasizing the heterogeneity of social cognition as a construct.
- Investigating social cognition in a developmental psychopathology framework would help further refine and describe the heterogeneity of adolescent disorders.
- Using ERP as an electrophysiological correlate to evaluate social cognition as a pre-post measure gives us a more accurate measure of the changes in social cognition following the intervention.
- It would be a step towards providing integrated intervention related to social cognition that may help to lessen the consequences of probable psychiatric conditions and prevent dysfunctional behavioural patterns from becoming chronic.
- This study will probably set path for further studies in psychological disorders of adolescence.
- It would also add to existing literature on internalizing behavioural problems in adolescence by taking into consideration the limitations of previous researches.

RESEARCH HYPOTHESIS:

- There will be no significant difference in outcome measure of social cognition at pre intervention, post intervention, and one month follow-up between experimental group (group receiving the intervention) and group receiving treatment as usual.
- There will be no significant difference in outcome measures of severity of the symptoms at pre intervention, post intervention, and one month follow-up in experimental group (group receiving the intervention) and group receiving treatment as usual.

- There will be no significant difference in outcome measure of early maladaptive schemas at pre intervention, post intervention, and one month follow-up in experimental group (group receiving the intervention) and group receiving treatment as usual.
- There will be no significant difference in outcome measure of mindfulness at pre intervention, post intervention, and one month follow-up in experimental group (group receiving the intervention) and group receiving treatment as usual.
- There will be no significant difference in outcome measure of global functioning at pre intervention, post intervention, and one month follow-up in experimental group (group receiving the intervention) and group receiving treatment as usual.
- There will be no significant difference in electrophysiological measure at pre intervention and post intervention in experimental group (group receiving the intervention) and group receiving treatment as usual.
- There will be no significant association between social cognition, severity of illness, early maladaptive schemas, mindfulness and global functioning in adolescents with internalizing behavioural problems receiving Brief Integrated Schema and Mindfulness-based Intervention.

FUNCTIONAL OUTCOME VARIABLES:

Primary Outcome Variables:

- Social Cognition
- Severity of symptoms

Secondary Outcome Variables:

- Early Maladaptive Schemas
- Mindfulness
- Global functioning
- Electrophysiological measure

OPERATIONAL DEFINITIONS OF VARIABLES:

Outcome Variables:

- **Social Cognition:** Social cognition refers to an array of abilities that involve cognitive capability applied to social situations. The National Institute of Mental Health identified five social cognitive domains: theory of mind (ToM), social perception, social knowledge,

attributional bias, and emotion processing. (Green et al., 2005) In the present study, social cognition has been measured using Social Cognition Rating Tools in Indian Setting-SOCRATIS.

- **Severity of Symptoms:** According to DSM-5, severity relates to the number of symptoms, level of distress caused by intensity of symptoms, and impairment in social and occupational functioning. In the present study severity of symptoms of depression and anxiety was measured using Beck Youth Inventory- Depression and Anxiety Scale, severity of symptoms of dissociation was measured using Adolescent Dissociative Experiences Scale (A-DES) and severity of symptoms of obsession and compulsion was used using Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS).
- **Early Maladaptive Schemas:** An Early Maladaptive Schema is a broad, pervasive theme or pattern comprised of memories, emotions, cognitions, and bodily sensations regarding oneself and one's relationships with others developed during childhood or adolescence elaborated throughout one's lifetime and dysfunctional to a significant degree. (Young, 1994) In the present study, early maladaptive schemas have been measured using the Young Schema Questionnaire Short Form (YSQ-SF).
- **Mindfulness:** Mindfulness is generally defined as a quality of consciousness (p. 211; Brown et al. 2007) that encompasses present-moment awareness and incorporates a nonjudgmental attitude towards internal and external experiences (Hayes et al. 2011; Kabat-Zinn et al. 1985). In the present study, mindfulness has been measured using Children and Adolescent Mindfulness Measure (CAMM).
- **Global functioning:** It is constructed as an overall (global) measure of how patients are doing and rates psychological, social, and occupational functioning, covering the range from positive mental health to severe psychopathology. (DSM IV TR, 2000) In the present study, global functioning has been measured using Children's Global Assessment Scale (CGAS).
- **Electrophysiological Measure (P300):** The P300 is component of ERP that provides information about cognitive processes in the brain, such as memory, attention, concentration and speed of mental processing (Casali et al., 2016). In the present study, P300 has been measured using Event Related Potential (ERP) based on Facial Emotion Recognition Task.

Study intervention:

- **Brief Integrated Schema and Mindfulness based Intervention Module:** The present study includes a brief intervention module based on integration of the components from the following pre-established evidence-based treatments- Schema Therapy for Children and Adolescents

(ST-CA) (Loose et al., 2020) and DBT for Adolescents (DBT-A) (Rathus and Miller, 2002), with modifications based on literature findings.

- **Treatment Completers:** In the present study, Treatment Completers have been defined as participants who have attended at least 75% of the allotted number of sessions. (Barlow, 2017)
- **Treatment Dropouts:** Treatment dropouts have been defined as participants completing less than 75% of the prescribed number of sessions. (Barlow, 2017)

RESEARCH DESIGN AND METHODOLOGY:

Venue of study: Erna Hoch Centre for Child and Adolescent Psychiatry (CCAP) at Central Institute of Psychiatry, Ranchi.

Study Design: Prospective, hospital based, Experimental study

Sampling Method: Sample will be selected using the purposive sampling method.

The participants would be randomly assigned to groups with each participant being assigned a sequential random number generated through the computer using Microsoft Excel. The numbers would be written in a series of sealed envelopes. The envelope for each participant would be opened immediately before the commencement of the first session by the clinician.

Sample Size:

Sample size estimation was performed using G*Power 3.1.9.2 software for 2 groups with 3-time point a priori sample size calculations with effect size kept as moderate to good, power as 95% and p value=0.05 level of performing repeated measure ANOVA. The total size calculated was 20. Hence, the sample size for the current study is to be kept at 20 per group.

The study will comprise adolescents in the age group of 12 to less than 18 years with internalizing behavioural problems with a diagnosis of (Generalised Anxiety disorder, Obsessive Compulsive Disorder, Dissociative Disorder, and Depression). 20 adolescents among them shall receive the proposed Brief Integrated Schema and Mindfulness-based Intervention along with treatment as usual whereas the 20 others shall be in the treatment as usual group who would be kept on the waiting list till completion of the study.

Inclusion Criteria:

- Participants with a diagnosis of Generalized Anxiety disorder, Obsessive-Compulsive Disorder, Dissociative Disorder, and Depression as per Diagnostic Criteria of ICD 10 DCR (WHO 1993).

- Participants scoring above the cut-off score of 3 and above on Emotional disorder, 1 on Obsessive-Compulsive Disorder (OCD) clusters of DPCL.
- Participants of both genders.
- Participants from age 12 to 17 years 11 months.
- Participants having Average IQ (IQ 90 and above) measured by Seguin- Form Board Test (SFBT) and social quotient by Vineland social maturity scale (VSMS).
- Participants who can comprehend Hindi and/or English language.
- Participants with no history of receiving structured psychotherapeutic intervention in last 6 months.

Exclusion Criteria:

- Participants diagnosed with any other psychiatric disorders.
- Participants with a history of chronic or other significant general medical/neurological illness.
- Participants with a Cut-off score of 3 and above on the psychosis cluster of DPCL.
- Participants who had prior exposure to any mode of brain stimulation in last 3 months.

SOURCES OF DATA AND TOOLS TO BE USED IN COLLECTION OF DATA:

- **Informed Consent Form:** Permission would be taken from the participants' parents/caregiver before conducting the study. The Informed Consent will provide information about the research purpose, procedure, duration, participant selection, voluntary participation and confidentiality of the study along with Certificate of Consent.
- **Assent Form**: Permission would be taken from the participants before conducting the study. The Assent form will provide information about the research purpose, procedure, duration, participant selection, voluntary participation and confidentiality of the study along with Certificate of Consent.
- **Semi-structured socio-demographic and clinical data sheet:** It will include details regarding personal demographics and socio-economic characteristics including age, sex, education, occupation, marital status, religion, caste, domicile, family income, duration of illness of the patient, past history of illness, family history of illness, etc. Additional information will be gathered from the institute's case record file of the participant. The information shall include guardians' details, residence details, chief complaints upon presentation, onset, and course of illness, presence of any other precipitating factor apart from trauma, history of past medical/psychiatric illness in the patient and/or in family, treatment history, personal history,

premorbid traits, investigations (if any done), physical examination findings (if done), diagnosis (if made).

Screening tool

1. Developmental Psychopathology Check List (Kapur et al, 1994)
2. Seguin- Form Board Test (SFBT, Bharatraj)
3. Vineland Social Maturity Scale (VSMS, Malin)

Pre-Post Treatment Measure

1. Beck Youth Inventory (BYI)
2. Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS)
3. Adolescent Dissociative Experiences Scale-II (A-DES)
4. Social Cognition Rating Tools in Indian Setting- SOCRATIS
5. Young Schema Questionnaire (Short Form)
6. Child and Adolescent Mindfulness Measure (CAMM)
7. Children's Global Assessment Scale (CGAS)
8. Electrophysiological measure via ERP

- **Developmental Psychopathology Checklist-DPCL (Kapur M, Barnabas I, Reddy MV &Rozario J, 1995):** Developmental Psychopathology Checklist (DPCL) is an Indian adaptation of the Child Behaviour Check List (CBCL) developed at NIMHANS in 1995. The psychopathology section consists of 7 clusters: Hyperkinesis, Conduct, Learning disorder, Emotional disorder, Obsessive-Compulsive Disorder (OCD), Somatisation and Psychosis. Each cluster generates a separate total score and the cut-off score for each section. The scores which fall above the cut-offs are interpreted as deviant. The reliability of the entire checklist by interclass correlation coefficient (ICC) through analyses of variance is 0.96 (Kapur M, Barnabas I, Reddy MV & Rozario J, 1995).

- **Sequin-Form Board Test (SFBT):** Seguin Form Board test assesses visuospatial perception, organization and discrimination, psychomotor dexterity, coordination and development, as well as motor and cognitive speed for children between 4 to 20 years (Cattel, 1953; David and Virginia, 1972; Venkatesan, 2014). It's also used as a quick measure of general intelligence in children between 3 to 11 and for mentally retarded adults.

- **Vineland Social Maturity Scale (VSMS):** The Vineland Social Maturity Scale (VSMS) measure the differential social capacities of an individual. It provides an estimate of Social Age (SA) and Social Quotient (SQ), shows high correlation (0.80) with intelligence. It is designed to measure social maturation in eight social areas: Self-help general (SHG), Self-help eating (SHE), Self-help dressing (SHD), Self- direction (SD), Occupation (OCC), Communication (COM), Locomotion (LOM), and Socialization (SOC). The scale consists of 89 test items grouped into year levels.

- **Beck Youth Inventory (BYI):** The Beck Youth Inventories is made up of 20 item scales, including the Beck Youth Depression Inventory, the Beck Youth Anxiety Inventory, the Beck Youth Anger Inventory, the Beck Youth Destructive Inventory and the Beck Youth Self-Concept Inventory. The Beck Youth Inventory is a self-reported instrument for youth 7 to 18 years and is widely used in research and clinical settings. Each inventory contains 20 statements about thoughts, feelings and behaviors associated with emotional and social impairment in youth. Children and adolescents describe how frequently the statement has been true for them. Items are written at a 2nd grade level. It is a 4-point frequency scale with anchors of 0 marked as Never and 3as Always. It measures depression, anxiety, anger, destructive behaviors and self-concept. Its internal consistency of the five inventories were all high (coefficients >0.84). The test-retest reliabilities were calculated, and yielded correlation coefficients in the ranges of .74 to .90 for ages 7-10, .84 to .93 for ages 11-14, and .83 to .93 for ages 15-18. In general, test-retest reliabilities were the same for both males and females. The BYI-II manual discusses several validation studies that were conducted. The first study compared the BYI-II to the Children's Depression Inventory (CDI) using a subsample of 128 children ages 7-14. According to the manual, the BYI-II depression scale was correlated at .72 with the total score of the CDI scale, suggesting that the tools measure degrees of depression similarly. The authors also used a sub-sample of 26 youth (ages 15-18) whose scores yielded an averaged correlation coefficient of .67 between the BYI-II depression scale and the CDI total score.
- **Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS):** The CY-BOCS is a 10-item clinician-administered scale that represents a total scale as well as two subscales (obsessions and compulsions). Both subscales are identically structured, with five items assessing frequency, distress, interference, resistance, and control over either obsessions or compulsions. Each item is rated from 0 to 4, with higher numbers indicating greater severity of symptoms. Reliability analysis showed that the CY-BOCS had adequate internal

consistency for the obsessions (α= .92) and compulsions (α= .94) subscale scores and for the total score (α= .95). (McKay et al., 2003)

- **Adolescent Dissociative Experiences Scale-II (A-DES):** The A-DES (Armstrong et al., 1997) contains 30 statements. Respondents indicate how much each experience happens to them on a 0 to 10 scale ("never" to "always"). The A-DES is scored by summing item scores and dividing by 30, giving an overall score out of 10. Higher scores indicate greater levels of dissociation. Two studies investi-gating the psychometric properties of the A-DES (Armstrong et al., 1997; Smith and Carlson, 1997) calculated Cronbach's alpha at .92 or .93 for the whole scale and found Spearman-Brown split-half reliabilityof.92or.94. Smith and Carlson (1997) also showed a 2-week test-retest reliability of .77

- **Social Cognition Rating Tools in Indian Setting- SOCRATIS (Mehta et al, 2011):** It is a test battery, which includes tools for social cognition constructs. The following tests of theory of mind, attribution bias and social perception will be used. These tests are modified to suit the Indian cultural context.
  - Theory of Mind (ToM): Story-based tasks examines the ability at different complexity levels to 'metarepresent' mental states of others. The first order ToM, second order ToM, and metaphorirony tasks would be used.
  - Attributional Bias Questionnaire (ABQ): This was assessed using a 32-point questionnaire where subjects were required to make causal attributions for positive and negative social events, adapted from the Internal, Personal,and Situational Attributions Questionnaire (Kinderman and Bentall, 1996).Apart from satisfactory content and known groups validity, this test also had satisfactory internal consistency.
  - Social Cue Recognition Test in Indian Setting (SoCueReTI): Modified from Social Cue Recognition Test (Corrigan & Green , 1993) to measure social perception. It consists of 8 short videos of 2-3 people talking. Following the video, true-false questions are asked to the test taker. 18 cues (9social and 9 non-social cues) are presented to the subject after each video is played. Score is given for correct identification of each cue(true/false). Social perception hit rate and social perception index is then calculated.

- **Young Schema Questionnaire (Short Form):** The Young Schema Questionnaire SF (YSQ-SF) developed by **Young et al (1998)** is s a 75-item self-report psychometric tool designed to evaluate the manifestations of 15 Early Maladaptive Schemas (EMS). It aims to evaluate 15

EMS (5 items each). Items are scored on a Likert scale ranging from 1 (Completely false about me) to 6 (Describes me perfectly). High scores on a specific subscale index denote stronger manifestations of the assessed EMS. The internal consistency reliability for the total scale have been found to be 0.96, and for the factors ranged from 0.65 to 0.86.

- **Child and Adolescent Mindfulness Measure (CAMM):** This measurement developed by **Greco et al (2011)** is used to measure mindfulness skills with items that reflect acting with present-moment awareness (e.g., "at school, I walk from class to class without noticing what I'm doing") with an attitude of acceptance and non-judgment. The scale items are rated on a 5-point Likert scale (0 = false to 4 = always true). The lowest total score is zero and the highest total score is 40; the higher the score, the more the individual's willingness for mindfulness. Cronbach's alpha for this questionnaire was reported as $\alpha = 0.81$.

- **Children's Global Assessment Scale (CGAS):** The Children's Global Assessment Scale (CGAS) is an adaptation of the Global Assessment Scale (GAS) developed by **Endicott et al. (1976)** and is designed to reflect the lowest level of functioning for a child or adolescent during a specified time period. The Children's Global Assessment Scale (CGAS) is a tool used to assess the global level of functioning and severity of mental illness in children and adolescents. It has been widely replaced by the Global Assessment of Functioning (GAF) developed for the Diagnostic and Statistical Manual of Mental Disorders. The CGAS uses various scales that assess a child's psychological, social, and occupational functioning. The scoring on the scales ranges from positive mental health to severe psychopathology. The authors report an interrater reliability of 0.84, and a test-retest reliability of 0.85. The authors report evidence of discriminative validity. Further studies have found evidence of discriminant validity and mixed convergent validity (Measure Profile, 2012).

- **Event-Related Potential (EB Neuro S.p.A- E Prime3):** Event-related potential (ERP) recording will be done Evoked Potential Measuring system (EBNeuron), using Galileo NT Software. The Galileo NT software contains specialized modules for acquisition, storage and display of biological signals, specially designed for management of encephalic signals like Electrophysiology (EEG, video EEG), Polysomnography (PSG), Evoked Potential (EP), Event-Related Potential (ERP), and Electromyography (EMG). The ERP is managed by Galileo NT database known as ERP Glant. ERP recording will be done on the basis of a constructed task on social cognition.

INTERVENTION GUIDELINES

Intervention Structure: Brief-Integrated Schema and Mindfulness-based Intervention module

Total number of therapy sessions: 14 sessions

Duration of each session: 60-90 minutes

Frequency:3/week.

Total duration of intervention: 5 weeks

Assessments: Pre-intervention, post-intervention, and at 1 month follow up

Components Addressed: The session components have been derived based on the literature review of areas of impact of internalizing behavioural problems and empirical-based techniques of mindfulness and schema therapy.

Session no	Technique	Content of the session
1	Orientation and Rapport Establishment	• Establishing rapport and trust. • Explaining the need for therapeutic intervention, describing briefly the techniques to be used. • Explaining the goals of the next sessions
2 and 3	Psychoeducation about the intervention module • Mindfulness • Schemas and schema modes • Needs • Coping Styles	• Introduction to meditation and mindfulness, discussing the benefits of mindfulness with reference to the current problems. • Defining the basic psychological-emotional needs of humans, discussing strengths and weaknesses • Introducing the concept of schemas, modes, needs, and coping styles • Explaining the schemas and their roots based on the concept of unmet needs.

4 and 5	Initiating mindfulness: • Open Mind and Focused Mind • Wise Mind- What and How Skills	• Explaining the objectives of the mindfulness training, practice of thoughts and feelings (learning that emotions result from the position and its interpretation) • Investigating pleasant events and body feelings, thoughts, emotions and temper associated with the pleasant event • Initiating mindfulness training
6	Schema awareness: • Recapitulation of schema model • Imagery • Positive schemas through Treasure Bag	• Recapitulation and review of schema concepts • Discussing strengths and weaknesses of the child Implementing an imaginary interview with parents (playing the parent's role)
7	• Inner house technique • Mode flashcards	• Identification and naming of schemas, exploration of schema modes, and identifying coping styles • Explaining and drawing the modes, explicating sore points and roots • Delineating coping modes
8,9 and 10	• Examining flashcards • Conceptualisation and Schema activation • Schema triggering and mode analysis notebook • Empathetic confrontation • Reparenting • Multiple chair technique	• Interviewing the dysfunctional mode technique • Conceptualizing the problem according to the schema approach with modes • Limitations of the vicious cycle • Assigning evidence confirming the schemas to childhood experiences and dysfunctional parenting styles, identifying unfulfilled emotional needs and fighting against schemas and how that leads to the current problem • Working with mode flashcards

		• Self-compassion training with vulnerable child and assertive behaviour.
11 and 12	• Modifying the early maladaptive schemas • Imagery rescripting, safe place imagery • Schema diary (Including healthy coping skills) • Behavioural experiments, role-playing, pros and cons analysis, commitment to change	• Creating learning experiences by testing EMS or dysfunctional thoughts in real life • Reminding and encouraging to use healthy coping responses as opposed to maladaptive coping skills • Providing a comprehensive list of problematic behaviours, determining change priorities and identifying therapeutic targets, practicing healthy behaviours, and overcoming behaviour change obstacles.
13 and 14	• Clever and wise mode technique • Recapitulation of concepts • Termination	• Reviewing and practising assignments • Fantasy trip to the clever and wise mode and its congruence with the aroma of lemon Answering questions about the instructed concepts; checking the assignments; discussing about clever and wise imagery.

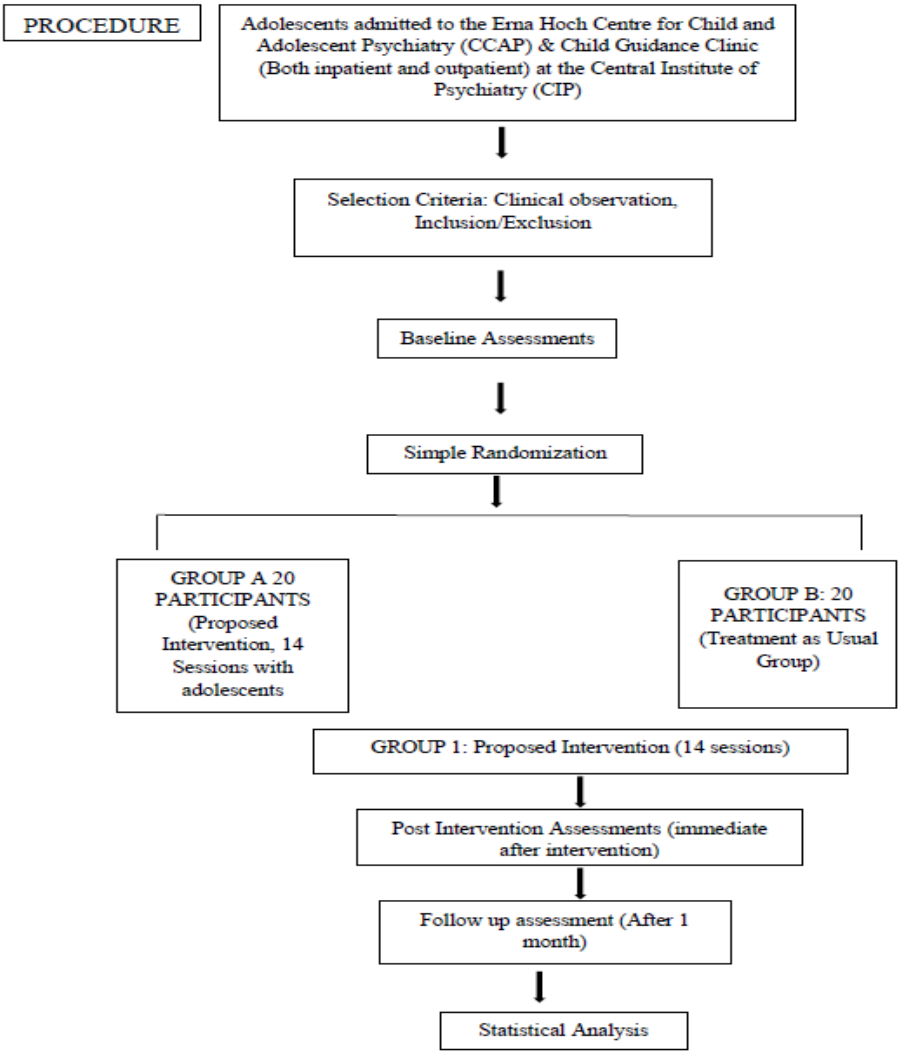
PROCEDURE:

The present study will be an experimental study where the sample will be selected through purposive sampling. Adolescents admitted to the Erna Hoch Centre for Child and Adolescent Psychiatry (CCAP) at the Central Institute of Psychiatry (CIP) with a diagnosis of Generalised Anxiety disorder, Obsessive-Compulsive Disorder, Dissociative Disorder, and Depression and scoring above the cut-off score of 3 and above on Emotional Disorder, 1 on obsessive - compulsive disorder (OCD) clusters of DPCL further will be enrolled for the study. Based on clinical observation and scoring from the screening tools, those fulfilling inclusion and exclusion criteria, and giving written consent will be recruited. The socio-demographic and clinical data sheet will be completed. The participants would

be taken by purposive sampling and would be randomly allocated to two groups. A brief intervention module will be developed based on integration of the components from the following pre-established evidence-based treatments- Schema Therapy for Children and Adolescents (ST-CA) and DBT for Adolescents (DBT-A). 20 participants will be allocated to group 1 and will receive the brief integrated schema and mindfulness-based therapeutic intervention. 20 participants will be in group 2 i.e., the waitlist group who will receive treatment as usual. No other non-pharmacological intervention shall be given to either the study or control group during a period of 5 weeks. For both groups, assessment measures at baseline will be done. The proposed intervention module would be applied to the study group. Assessment for electrophysiological measure will be done only immediate post intervention after 5 weeks. Repeat assessment for other outcome measures will be applied after 5 weeks (immediate end of intervention) and a follow-up assessment after 1 month (9^{th} week) will be taken for both groups.

ANALYSIS OF DATA:

The data which will be obtained through pre-assessment, post-assessment and follow up assessment from the participants will be analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics will be used to describe socio-demographic and clinical variables. Repeated measures ANOVA will be used to assess if there is any significant difference in the participants after receiving the integrated therapeutic intervention. Pearson r-correlation will be used to assess the relationship between the variables.


PROCEDURE
Adolescents admitted to the Erna Hoch Centre for Child and Adolescent Psychiatry (CCAP) & Child Guidance Clinic (Both inpatient and outpatient) at the Central Institute of Psychiatry (CIP)
Selection Criteria: Clinical observation, Inclusion/Exclusion
Baseline Assessments
Simple Randomization
GROUP A 20 PARTICIPANTS (Proposed Intervention, 14 Sessions with adolescents
GROUP B: 20 PARTICIPANTS (Treatment as Usual Group)
GROUP 1: Proposed Intervention (14 sessions)
Post Intervention Assessments (immediate after intervention)
Follow up assessment (After 1 month)
Statistical Analysis

SIGNIFICANCE OF THE STUDY:

The significance for the present study entails the role of social cognition in the etiology or development of internalizing behavioural problems in adolescence. Of course, the opposite may also be true. Social cognitive deficits may be the result of psychopathology and not the cause. Thus, examining social cognition in relation to internalizing behavioural problems in adolescence emphasizes the heterogeneity of social cognition as a construct. Moreover, investigating social cognition in a developmental psychopathology framework helps us further refine and describe the heterogeneity of adolescent disorders as well. Given their relatively remote relationship to mental processes of interest, it is typically difficult to evaluate hypotheses about the mechanisms underlying social cognitive processes using just behavioural and task-based approaches. Using ERP as an electrophysiological correlate to evaluate social cognition as a pre- and post-measure gives us a more accurate measure of the changes in social cognition following the intervention.

The central tenet of schema therapy is that changing inefficient schemas and schema modes serves as the foundation for behavioral change. Studies have shown behavior therapy results in superficial and short-term change and modification of behaviour in children. However, it appears that changes in schemas are deeper, more effective, and stable because they are part of a more complex mechanism that includes the body's reaction, thoughts, affections, and behavior, all of which lead to more expansive and stable changes. Schema therapy stands as an established therapeutic intervention in long and chronic disorders. However, the role of schema therapy in adolescent psychopathology still stands underexplored. The integration of mindfulness-based interventions (MBIs) with traditional therapies has increased in a variety of clinical and institutional settings, but almost exclusively in adult populations. Only recently has the focus shifted toward the application of MBIs to children and adolescents. Thus, integration of mindfulness into the schema intervention would not only help in addressing deep core issues of the adolescents but also help in bringing about a mindful awareness of the inner experiences from a non-judgmental stance.

ITS RELEVANCE TO THE PRESENT-DAY PROBLEM AND NEED TO THE SOCIETY:

In the present decade there is a perceived need for recovery techniques with children and adolescents that focus on prevention, early intervention, building socio-cognitive competence, and enhancing positive growth. Adolescence is a time when internalizing symptoms typically manifest, and early intervention can help prevent the emergence of more serious or persistent issues. Adolescent research on internalizing behaviours and associated symptomatology could help develop more precise theoretical models of these occurrences as well as indicate the way to more successful interventions. Additionally, carrying out such interventions when personality is more malleable than in adulthood may help to lessen the consequences of probable psychiatric conditions and prevent dysfunctional behavioural patterns from becoming chronic.

Schema therapy gradually builds a solution-based bridge between the experience of the child and adolescent and the changes associated with daily life, thereby nurturing positive development and change and preventing the stabilization (continuation) of symptoms and problems. Thus, it would be interesting to see, how addressing schemas during the developmental phase can help in preventing more long-standing problems. Within clinical context, the use of mindfulness-based therapies for adolescents is rising rapidly. In addition to improving functioning and skills in attentional focus and concentration, emotion regulation, social and academic performance, adaptive coping, frustration tolerance, self-control, and self-esteem, proponents emphasize benefits in reducing a wide spectrum of psychopathology, including internalizing and externalizing behaviours. To this end, mindfulness-based interventions may be desirable and helpful beginning in early childhood and adolescence to

encourage healthy development, prevent expected setbacks, or lessen the effects of existing illnesses or impairments.

CONTRIBUTION TO THE EXISTING KNOWLEDGE:

There are very few researches with respect to studying social cognition in internalizing behavioural problems in Indian context at present. Thus, this study will identify the domains of social cognition affected in Internalizing behavioural problems in children and adolescents in the Indian context. There are also few researches that has highlighted the applicability of an integrative approach of mindfulness and schema-based therapeutic intervention in children and adolescents, especially with regard to its effect on social cognition. Alongside, adding the domain of event-related potential (ERP) measure will provide precise information about the time dynamics of the brain in relation to social cognition. This would contribute in seeing the applicability of an integrative approach of mindfulness and schema-based therapeutic intervention that could be used for children and adolescents in Indian context in addressing both symptomatology as well as socio-cognitive deficits. Apart from this, the study will add to the existing literature on socio cognitive deficits and therapeutic interventions in children and adolescents with by taking into consideration the limitations of present study.

FUTURE WORK:

It is indeed important to consider the role of social cognition in adolescence owing to the fact that the social environment significantly impacts the development of the adolescent brain in several ways, thereby affecting their transactions with the environment. In this regard, the role of early maladaptive schemas finds prime importance as well as they serve as the basis for deficits in social information processing. However, the role of social cognition is not limited to the purview of internalizing behavioural problems and future work can focus on other childhood disorders, other co-morbid conditions as well as other domains of social cognition in relation other important constructs like emotional intelligence and non-social cognition as well.

REFERENCES:

Achenbach, T. M. (1991). Manual for the Child Behavior Checklist/4-18 and 1991 profile. Burlington, VT: University of Vermont, Department of Psychiatry.

Adolphs R. Cognitive neuroscience of human social behaviour. Nat Rev Neurosci. 2003 Mar;4(3):165-78. doi: 10.1038/nrn1056. PMID: 12612630.

American Psychiatric Association, DSM-5 Task Force. (2013). (5th ed.). American Psychiatric Publishing, Inc.. https://doi.org/10.1176/appi.books.9780890425596

Amodio DM, Mendoza SA. Implicit intergroup bias: Cognitive, affective, and motivational underpinnings. In: Gawronski B, Payne BK, editors. Handbook of Implicit Social Cognition. New York: Guilford; 2010. pp. 353–74.

Baker, L., & Cantwell, D. P. (1987). A prospective psychiatric follow-up of children with speech/language disorders. Journal of the American Academy of Child & Adolescent Psychiatry, 26(4), 546–553. https://doi.org/10.1097/00004583-198707000-00015

Bamelis, L. L., Evers, S. M., Spinhoven, P., & Arntz, A. (2014). Results of a multicenter randomized controlled trial of the clinical effectiveness of schema therapy for personality disorders. The American journal of psychiatry, 171(3), 305–322. https://doi.org/10.1176/appi.ajp.2013.12040518

Barlow, D. H. (2004). Psychological treatments. American Psychologist, 59(9), 869–878. https://doi.org/10.1037/0003-066X.59.9.869

Barlow, D. H., Allen, L. B., & Choate, M. L. (2004). Toward a Unified Treatment for Emotional Disorders. Behavior Therapy, 35(2), 205–230. https://doi.org/10.1016/S0005-7894(04)80036-4

Bartholow BD, Riordan MA, Saults JS, Lust SA. Psychophysiological evidence of response conflict and strategic control of responses in affective priming. Journal of Experimental Social Psychology. 2009;45:655–66.

Batista, Sonia & Alves, Carolina & C. d'Almeida, Otília & Afonso, Ana & Felix-Morais, Ricardo & Pereira, João & Macário, Maria & Sousa, Livia & Castelo-Branco, Miguel & Santana, Isabel & Cunha, Luis. (2017). Disconnection as a mechanism for social cognition impairment in multiple sclerosis. Neurology. 89. 10.1212/WNL.0000000000004060.

Beck, A. T. (1976). Cognitive therapy and the emotional disorders. International Universities Press.

Beck, A. T. (1991). Cognitive therapy as the integrative therapy. Journal of Psychotherapy Integration, 1(3), 191–198. https://doi.org/10.1037/h0101233

Bentin S, Allison T, Puce A, Perez E, McCarthy G. Electrophysiological studies of face perception in humans. Journal of Cognitive Neuroscience. 1996; 8:551–65.

Bernstein, David & Nijman, Henk & Karos, Kai & Keulen-de Vos, Marije & Vogel, Vivienne & Lucker, Tanja. (2012). Schema Therapy for Forensic Patients with Personality Disorders: Design and Preliminary Findings of a Multicenter Randomized Clinical Trial in the Netherlands. International Journal of Forensic Mental Health. 11. 312-324. 10.1080/14999013.2012.746757.

Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring Self-Compassion and Empathy in the Context of Mindfulness-Based Stress Reduction (MBSR). Stress and Health, 26, 359-371.

Blackwood D. H. R, Muir W. J. Cognitive brain potentials and their application. The British Journal of Psychiatry. 1990; 157:96–101.

Blakemore SJ. The social brain in adolescence. Nat Rev Neurosci. 2008 Apr;9(4):267-77. doi: 10.1038/nrn2353. PMID: 18354399.

Blakemore SJ, Mills KL. Is adolescence a sensitive period for sociocultural processing? Annu Rev Psychol. 2014;65:187-207. doi: 10.1146/annurev-psych-010213-115202. Epub 2013 Sep 6. PMID: 24016274.

Bradley, B., & Mathews, A. (1983). Negative self-schemata in clinical depression. British Journal of Clinical Psychology, 22(3), 173–181. https://doi.org/10.1111/j.2044-8260.1983.tb00598.x

Braet, C., Claus, L., Verbeken, S., & Van Vlierberghe, L. (2007). Impulsivity in overweight children. European child & adolescent psychiatry, 16(8), 473–483. https://doi.org/10.1007/s00787-007-0623-2

Brown, C.L., Gibbons, L.E., Kennison, R.F., Robitaille, A., Lindwall, M., Mitchell, M., Shirk, S.D., Atri, A., Cimino, C.R., Benitez, A., MacDonald, S.W.S., Zelinski, E., Willis, S.L., Schaie, K.W., Johansson, B., Dixon, R.A., Mungas, D.M., Hofer, S.M. & Piccinin, A.M. (2012). Social activity and cognitive functioning over time: a coordinated analysis of four longitudinal studies. Journal of Aging Research, vol. 2012, Article ID 287438, 12 pages. doi:10.1155/2012/287438.

Calvete, E., & Orue, I. (2012). The role of emotion regulation in the predictive association between social information processing and aggressive behavior in adolescents. International Journal of Behavioral Development, 36(5), 338–347. https://doi.org/10.1177/0165025412444079

Casali RL, Amaral MI, Boscariol M, Lunardi LL, Guerreiro MM, Matas CG, et al. Comparison of auditory event-related potentials between children with benign childhood epilepsy with centrotemporal spikes and children with temporal lobe epilepsy. *Epilepsy Behav*. (2016) 59:111–6. doi: 10.1016/j.yebeh.2016.03.024

Casey BJ, Jones RM, Hare TA. The adolescent brain. Ann N Y Acad Sci. 2008 Mar;1124:111-26. doi: 10.1196/annals.1440.010. PMID: 18400927; PMCID: PMC2475802.

Coyne, J. C. (1976). Depression and the response of others. Journal of Abnormal Psychology, 85(2), 186–193. https://doi.org/10.1037/0021-843X.85.2.186

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. Psychological Bulletin, 115(1), 74–101. https://doi.org/10.1037/0033-2909.115.1.74

Crone, E.A. (2013), Considerations of Fairness in the Adolescent Brain. Child Dev Perspect, 7: 97-103. https://doi.org/10.1111/cdep.12022

Damon, W. (2004). What is positive youth development? Annals of the American Academy of Political and Social Science, 591, 13–24. https://doi.org/10.1177/0002716203260092

Deffke I, Sander T, Heidenreich J, et al. MEG/EEG sources of the 170-ms response to faces are co-localized in the fusiform gyrus. Neuroimage. 2007;35:1495–501.

Eimer M. Event-related brain potentials distinguish processing stages involved in face perception and recognition. Clinical Neurophysiology. 2000;111(4):694–705.

Eisenberg, N., Cumberland, A., Spinrad, T. L., Fabes, R. A., Shepard, S. A., Reiser, M., Murphy, B. C., Losoya, S. H., & Guthrie, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. Child development, 72(4), 1112–1134. https://doi.org/10.1111/1467-8624.00337

Endicott, J., Spitzer, R. L., Fleiss, J. L., & Cohen, J. (1976). The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. *Archives of general psychiatry*, *33*(6), 766–771. https://doi.org/10.1001/archpsyc.1976.01770060086012

Ernst M, Fudge JL. A developmental neurobiological model of motivated behavior: anatomy, connectivity and ontogeny of the triadic nodes. Neurosci Biobehav Rev. 2009 Mar;33(3):367-82. doi: 10.1016/j.neubiorev.2008.10.009. Epub 2008 Nov 6. PMID: 19028521; PMCID: PMC2696617.

Farrell, J. M., Shaw, I. A., & Webber, M. A. (2009). A schema-focused approach to group psychotherapy for outpatients with borderline personality disorder: a randomized controlled trial. Journal of behavior therapy and experimental psychiatry, 40(2), 317–328. https://doi.org/10.1016/j.jbtep.2009.01.002

Farrington, A., Waller, G., Smerden, J., & Faupel, A. W. (2001). The adolescent dissociative experiences scale: psychometric properties and difference in scores across age groups. *The Journal of nervous and mental disease*, *189*(10), 722–727. https://doi.org/10.1097/00005053-200110000-00010

Fish, B., & Shapiro, T. (1964). A Descriptive Typology Of Children's Psychiatric Disorders. Ii. A Behavioral Classification. Psychiatric Research Reports, 18, 75–90.

Forbes CE, Grafman J. The role of the human prefrontal cortex in social cognition and moral judgment. Annu Rev Neurosci. 2010;33:299-324. doi: 10.1146/annurev-neuro-060909-153230. PMID: 20350167.

Franco, F. (1997). The development of meaning in infancy: Early communication and social understanding. In S. Hala (Ed.) The development of social cognition. Hove: Psychology Press, 1997 (pp. 95-160).

Freeman, J., Flessner, C. A., & Garcia, A. (2011). The Children's Yale-Brown Obsessive Compulsive Scale: reliability and validity for use among 5 to 8 year olds with obsessive-compulsive disorder. *Journal of abnormal child psychology*, *39*(6), 877–883. https://doi.org/10.1007/s10802-011-9494-6

Frith CD, Frith U. Interacting minds--a biological basis. Science. 1999 Nov 26;286(5445):1692-5. doi: 10.1126/science.286.5445.1692. PMID: 10576727.

Giedd JN, Blumenthal J, Jeffries NO, Castellanos FX, Liu H, Zijdenbos A, Paus T, Evans AC, Rapoport JL. Brain development during childhood and adolescence: a longitudinal MRI study. Nat Neurosci. 1999 Oct;2(10):861-3. doi: 10.1038/13158. PMID: 10491603.

Giesen-Bloo, J., van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., Kremers, I., Nadort, M., & Arntz, A. (2006). Outpatient psychotherapy for borderline personality disorder:

randomized trial of schema-focused therapy vs transference-focused psychotherapy. Archives of general psychiatry, 63(6), 649–658. https://doi.org/10.1001/archpsyc.63.6.649

Gogtay N, Giedd JN, Lusk L, Hayashi KM, Greenstein D, Vaituzis AC, Nugent TF 3rd, Herman DH, Clasen LS, Toga AW, Rapoport JL, Thompson PM. Dynamic mapping of human cortical development during childhood through early adulthood. Proc Natl Acad Sci U S A. 2004 May 25;101(21):8174-9. doi: 10.1073/pnas.0402680101. Epub 2004 May 17. PMID: 15148381; PMCID: PMC419576.

Gray, J.A. (1981) 'A critique of Eysenck's theory of personality', in H.J. Eysenck (ed.), A Model for Personality. Berlin: Springer. pp. 246–76

Gray, J.A. (1987) Perspectives on Anxiety and Impulsivity: A Commentary. Journal of Research in Personality, 21, 493-509. http://dx.doi.org/10.1016/0092-6566(87)90036-5

Green MF, Penn DL, Bentall R, Carpenter WT, Gaebel W, Gur RC, Kring AM, Park S, Silverstein SM, Heinssen R. Social cognition in schizophrenia: an NIMH workshop on definitions, assessment, and research opportunities. Schizophr Bull. 2008 Nov;34(6):1211-20. doi: 10.1093/schbul/sbm145. Epub 2008 Jan 8. PMID: 18184635; PMCID: PMC2632490.

Greco, L. A., Baer, R. A., & Smith, G. T. (2011). Assessing mindfulness in children and adolescents: development and validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological assessment*, *23*(3), 606–614. https://doi.org/10.1037/a0022819

Huttenlocher PR. Synaptic density in human frontal cortex - developmental changes and effects of aging. Brain Res. 1979 Mar 16;163(2):195-205. doi: 10.1016/0006-8993(79)90349-4. PMID: 427544.

Huttenlocher PR, de Courten C, Garey LJ, Van der Loos H. Synaptogenesis in human visual cortex--evidence for synapse elimination during normal development. Neurosci Lett. 1982 Dec 13;33(3):247-52. doi: 10.1016/0304-3940(82)90379-2. PMID: 7162689.

Huttenlocher PR, Dabholkar AS. Regional differences in synaptogenesis n human cerebral cortex. Journal of Comparative Neurology. 1997; 387:167–178.

John, T.S., León, L., & Mcculloch, A. (2005). Childhood and Adolescent Mental Health: Understanding the Lifetime Impacts.

Joiner TE, Van Orden KA, Witte TK, Selby EA, Ribeiro JD, Lewis R, Rudd MD. Main predictions of the interpersonal-psychological theory of suicidal behavior: empirical tests in two samples of young

adults. J Abnorm Psychol. 2009 Aug;118(3):634-646. doi: 10.1037/a0016500. PMID: 19685959; PMCID: PMC2846517.

Jones, Susanne & Bodie, Graham & Hughes, Sam. (2016). The Impact of Mindfulness on Empathy, Active Listening, and Perceived Provisions of Emotional Support. Communication Research. 46. 10.1177/0093650215626983.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144–156. https://doi.org/10.1093/clipsy.bpg016

Kapur, M. et al. Developmental Psychopathology Check List for Children (DPCL) (A Preliminary Report). NIMHANS Journal, [S.l.], p. 1-9, jan. 1995.

Karimipour A , Asgari P , Makvandi B, Johari Fard R . Effects of Schema Therapy for Children and Adolescents on the Externalizing Behaviors of the Adolescents Referred to the Counseling Centers in Ahvaz, Iran. J Health Rep Technol. 2021;7(4):e118076. doi: 10.5812/ijhls.118076.

Kendall, P. C., Flannery-Schroeder, E., Panichelli-Mindel, S. M., Southam-Gerow, M., Henin, A., & Warman, M. (1997). Therapy for youths with anxiety disorders: a second randomized clinical trial. Journal of consulting and clinical psychology, 65(3), 366–380. https://doi.org/10.1037//0022-006x.65.3.366

Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry. 2005 Jun;62(6):593-602. doi: 10.1001/archpsyc.62.6.593. Erratum in: Arch Gen Psychiatry. 2005 Jul;62(7):768. Merikangas, Kathleen R [added]. PMID: 15939837.

Lavin C, Melis C, Mikulan E, Gelormini C, Huepe D, Ibañez A. The anterior cingulate cortex: an integrative hub for human socially-driven interactions. Front Neurosci. 2013 May 8;7:64. doi: 10.3389/fnins.2013.00064. PMID: 23658536; PMCID: PMC3647221.

Lemerise, E. A., & Arsenio, W. F. (2000). An Integrated Model of Emotion Processes and Cognition in Social Information Processing. Child Development, 71, 107-118.

Lenroot RK, Giedd JN. Brain development in children and adolescents: insights from anatomical magnetic resonance imaging. Neurosci Biobehav Rev. 2006;30(6):718-29. doi: 10.1016/j.neubiorev.2006.06.001. Epub 2006 Aug 2. PMID: 16887188.

Lindquist KA, Wager TD, Kober H, Bliss-Moreau E, Barrett LF. The brain basis of emotion: a meta-analytic review. Behav Brain Sci. 2012 Jun;35(3):121-43. doi: 10.1017/S0140525X11000446. PMID: 22617651; PMCID: PMC4329228.

Liu J. (2004). Childhood externalizing behavior: theory and implications. Journal of child and adolescent psychiatric nursing: official publication of the Association of Child and Adolescent Psychiatric Nurses, Inc, 17(3), 93–103. https://doi.org/10.1111/j.1744-6171.2004.tb00003.x

Luberto CM, Shinday N, Song R, Philpotts LL, Park ER, Fricchione GL, Yeh GY. A Systematic Review and Meta-analysis of the Effects of Meditation on Empathy, Compassion, and Prosocial Behaviors. Mindfulness (N Y). 2018 Jun;9(3):708-724. doi: 10.1007/s12671-017-0841-8. Epub 2017 Oct 23. PMID: 30100929; PMCID: PMC6081743.

Malhotra S, Patra BN. Prevalence of child and adolescent psychiatric disorders in India: a systematic review and meta-analysis. Child Adolesc Psychiatry Ment Health. 2014 Jul 21;8:22. doi: 10.1186/1753-2000-8-22. Erratum in: Child Adolesc Psychiatry Ment Health. 2017 Jul 12;11:39. PMID: 25071865; PMCID: PMC4113132.

McGinn, L. K., & Young, J. E. (1996). Schema-focused therapy. In P. M. Salkovskis (Ed.), Frontiers of cognitive therapy (pp. 182–207). The Guilford Press.

McNally, E. M., Golbus, J. R., & Puckelwartz, M. J. (2013). Genetic mutations and mechanisms in dilated cardiomyopathy. The Journal of clinical investigation, 123(1), 19–26. https://doi.org/10.1172/JCI62862

Mehta, U. M., Thirthalli, J., Naveen Kumar, C., Mahadevaiah, M., Rao, K., Subbakrishna, D. K., Gangadhar, B. N., & Keshavan, M. S. (2011). Validation of Social Cognition Rating Tools in Indian Setting (SOCRATIS): A new test-battery to assess social cognition. *Asian journal of psychiatry*, *4*(3), 203–209. https://doi.org/10.1016/j.ajp.2011.05.014

Merrell, K.W., et al. (2008) Social and Emotional Learning in the Classroom: Evaluation of Strong Kids and Strong Teens on Student's Social-Emotional Knowledge and Symptoms. Journal of Applied School Psychology, 24, 209-224. https://doi.org/10.1080/15377900802089981

Molenberghs P, Johnson H, Henry JD, Mattingley JB. Understanding the minds of others: A neuroimaging meta-analysis. Neurosci Biobehav Rev. 2016 Jun;65:276-91. doi: 10.1016/j.neubiorev.2016.03.020. Epub 2016 Apr 9. PMID: 27073047.

Muris, P. (2006). The Pathogenesis of Childhood Anxiety Disorders: Considerations from a Developmental Psychopathology Perspective. International Journal of Behavioural Development, 30, 5-11.

Nadort, M., Arntz, A., Smit, J. H., Giesen-Bloo, J., Eikelenboom, M., Spinhoven, P., van Asselt, T., Wensing, M., & van Dyck, R. (2009). Implementation of outpatient schema therapy for borderline personality disorder with versus without crisis support by the therapist outside office hours: A randomized trial. Behaviour research and therapy, 47(11), 961–973. https://doi.org/10.1016/j.brat.2009.07.013

Nauta, M. H., Scholing, A., Emmelkamp, P. M., & Minderaa, R. B. (2003). Cognitive-behavioral therapy for children with anxiety disorders in a clinical setting: no additional effect of a cognitive parent training. Journal of the American Academy of Child and Adolescent Psychiatry, 42(11), 1270–1278. https://doi.org/10.1097/01.chi.0000085752.71002.93

Oldehinkel, Albertine & Hartman, Catharina & Winter, Andrea & Veenstra, René & Ormel, Johan. (2004). Temperament profiles associated with internalizing and externalizing problems in preadolescence. Development and psychopathology. 16. 421-40. 10.1017/S0954579404044591.

Patriquin MA, DeRamus T, Libero LE, Laird A, Kana RK. Neuroanatomical and neurofunctional markers of social cognition in autism spectrum disorder. Hum Brain Mapp. 2016 Nov;37(11):3957-3978. doi: 10.1002/hbm.23288. PMID: 27329401; PMCID: PMC5053857.

Paus T, Keshavan M, Giedd JN. Why do many psychiatric disorders emerge during adolescence? Nat Rev Neurosci. 2008 Dec;9(12):947-57. doi: 10.1038/nrn2513. Epub 2008 Nov 12. PMID: 19002191; PMCID: PMC2762785.

Payne BK. Prejudice and perception: The role of automatic and controlled processes in misperceiving a weapon. Journal of Personality and Social Psychology. 2001;81:181–92.

Perrier, M. F., Gurgel-Juarez, N., Flowers, H. L., McCormick, A., & Short, S. J. (2020). Mindfulness-based interventions for children and adolescents across all settings: a scoping review protocol. Systematic reviews, 9(1), 286. https://doi.org/10.1186/s13643-020-01548-7

Pinkham, A. E., Penn, D. L., Green, M. F., Buck, B., Healey, K., & Harvey, P. D. (2014). The social cognition psychometric evaluation study: results of the expert survey and RAND panel. Schizophrenia bulletin, 40(4), 813–823. https://doi.org/10.1093/schbul/sbt081

Plenty, S., Östberg, V., Almquist, Y.B., Augustine, L., and Modin, B. (2014), Psychosocial working conditions: an analysis of emotional symptoms and conduct problems amongst adolescent students, Journal of Adolescence, 37 (4), 407–417.

Quay, H.C. Inhibition and Attention Deficit Hyperactivity Disorder. J Abnorm Child Psychol 25, 7–13 (1997). https://doi.org/10.1023/A:1025799122529

Raab, K. (2014) Mindfulness, Self-Compassion, and Empathy among Health Care Professionals: A Review of the Literature. Journal of Health Care Chaplaincy, 20, 95-108.

http://dx.doi.org/10.1080/08854726.2014.913876

Reva N. V., Pavlov S. V., Korenyok V. V., Loktev K. V., Aftanas L. I. (2015). The influence of long-term meditation practice on early emotional processing in the brain: an ERP study. Zh. Vyssh. Nerv. Deiat. Im. I P Pavlova 65 306–312.

Ridderinkhof, A., de Bruin, E. I., Blom, R., & Bögels, S. M. (2018). Mindfulness-Based Program for Children with Autism Spectrum Disorder and Their Parents: Direct and Long-Term Improvements. Mindfulness, 9(3), 773–791. https://doi.org/10.1007/s12671-017-0815-x

Ramon S, Healy B, Renouf N. Recovery from Mental Illness as an Emergent Concept and Practice in Australia and the UK. International Journal of Social Psychiatry. 2007;53(2):108-122. doi:10.1177/0020764006075018

Roelofs, Sanne & Boleij, Hetty & Nordquist, Rebecca & van der Staay, F. Josef. (2016). Making Decisions under Ambiguity: Judgment Bias Tasks for Assessing Emotional State in Animals. Frontiers in Behavioral Neuroscience. 10. 10.3389/fnbeh.2016.00119.

Rudolph, K. D. (2009). The interpersonal context of adolescent depression. In S. Nolen-Hoeksema & L. M. Hilt (Eds.), Handbook of depression in adolescents (pp. 377–418). Routledge/Taylor & Francis Group.

Salavera C, Usán P, Teruel P. The relationship of internalizing problems with emotional intelligence and social skills in secondary education students: gender differences. Psicol Reflex Crit. 2019 Jan 25;32(1):4. doi: 10.1186/s41155-018-0115-y. PMID: 32025973; PMCID: PMC6966764.

Scahill, L., Riddle, M.A., McSwiggin-Hardin, M., Ort, S.I., King, R.A., Goodman, W.K., Cicchetti, D. & Leckman, J.F. (1997). Children's Yale-Brown Obsessive Compulsive Scale: reliability and validity. J Am Acad Child Adolesc Psychiatry, 36(6):844-852.

Schmidt, N.B., Joiner, T.E., Young, J.E. and Telch, M.J. (1995) The Schema-Questionnaire: Investigation of psychometric properties and the hierarchical structure of a measure of maladaptive schemas. Cognitive Therapy and Research, 19, 295-321. doi:10.1007/BF02230402

Seeley WW, Crawford RK, Zhou J, Miller BL, Greicius MD. Neurodegenerative diseases target large-scale human brain networks. Neuron. 2009 Apr 16;62(1):42-52. doi: 10.1016/j.neuron.2009.03.024. PMID: 19376066; PMCID: PMC2691647.

Sharp, Carla, Peter Fonagy, and Ian Goodyer, 'Introduction', in Peter Fonagy, and Ian Goodyer (eds), Social Cognition and Developmental Psychopathology, International Perspectives in Philosophy & Psychiatry (Oxford, 2008; online edn, Oxford Academic, 1 Feb. 2013),

Shaw P, Kabani NJ, Lerch JP, Eckstrand K, Lenroot R, Gogtay N, Greenstein D, Clasen L, Evans A, Rapoport JL, Giedd JN, Wise SP. Neurodevelopmental trajectories of the human cerebral cortex. J Neurosci. 2008 Apr 2;28(14):3586-94. doi: 10.1523/JNEUROSCI.5309-07.2008. PMID: 18385317; PMCID: PMC6671079.

Sowell ER, Thompson PM, Holmes CJ, Jernigan TL, Toga AW. In vivo evidence for post-adolescent brain maturation in frontal and striatal regions. Nat Neurosci. 1999 Oct;2(10):859-61. doi: 10.1038/13154. PMID: 10491602.

Spear LP. The adolescent brain and age-related behavioral manifestations. Neuroscience and Biobehavioral Reviews. 2000;24:417–463.

Sutton S, Braren M, Zubin J, John ER. Evoked-potential correlates of stimulus uncertainty. *Science*. (1965) 150:1187–8. doi: 10.1126/science.150.3700.1187

Tan, Lucy & Lo, Barbara & Macrae, C.. (2014). Brief Mindfulness Meditation Improves Mental State Attribution and Empathizing. PLoS ONE. 9. 10.1371/journal.pone.0110510.

van Genderen, H. (2009). Schema therapy for borderline personality disorder. (A. Arntz, J. Drost, K. Sendt & S. Baumgarten-Kustner, Trans.). Wiley-Blackwell.

Van Overwalle F. Social cognition and the brain: a meta-analysis. Hum Brain Mapp. 2009 Mar;30(3):829-58. doi: 10.1002/hbm.20547. PMID: 18381770; PMCID: PMC6870808.

Van Vlierberghe, L., Braet, C., Bosmans, G., Rosseel, Y., & Bögels, S. (2010). Maladaptive schemas and psychopathology in adolescence: On the utility of young's schema theory in youth. Cognitive Therapy and Research, 34(4), 316–332. https://doi.org/10.1007/s10608-009-9283-5

Venta, A., Hart, J., & Sharp, C. (2013). The relation between experiential avoidance, alexithymia and emotion regulation in inpatient adolescents. Clinical child psychology and psychiatry, 18(3), 398–410. https://doi.org/10.1177/1359104512455815

Vreeswijk, M., Broersen, J. & Nadort, M. (Eds.) (2012). The Wiley-Blackwell handbook of schema therapy, theory, research, and practice. Oxford, UK: Wiley-Blackwell. 10.1111/cp.12018.

Walker-Andrews, A. S., & Dickson, L. R. (1997). Infants' understanding of affect. In S. Hala (Ed.), The development of social cognition (pp. 161–186). Psychology Press/Erlbaum (UK) Taylor & Francis.

Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, Charlson FJ, Norman RE, Flaxman AD, Johns N, Burstein R, Murray CJ, Vos T. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet. 2013 Nov 9;382(9904):1575-86. doi: 10.1016/S0140-6736(13)61611-6. Epub 2013 Aug 29. PMID: 23993280.

Young, J. E., & Brown, G. (1990). Young Schema Questionnaire. New York: Cognitive Therapy Center of New York

Young, J. E. (1990). Practitioner's resource series. Cognitive therapy for personality disorders: A schema-focused approach. Professional Resource Exchange, Inc.

Young, J. E. (1998). *Young Schema Questionnaire Short Form* (1st ed.). New York: Cognitive Therapy Center.

Young, J. E. (1999). Practitioner's resource series. Cognitive therapy for personality disorders: A schema-focused approach (3rd ed.). Professional Resource Press/Professional Resource Exchange.

Young, J. E., Klosko, J. S., & Weishaar, M. (2003). Schema Therapy: A practitioner's guide. New York: Guilford Publications.

Zarghami, Mehran & Khalilian, Alireza & Setareh, Javad & Salehpour, Golnaz. (2015). The Impact of Using Cell Phones After Light-Out on Sleep Quality, Headache, Tiredness, and Distractibility Among Students of a University in North of Iran. Iranian Journal of Psychiatry and Behavioral Sciences. 9. 10.17795/ijpbs-2010.

Zelli, A., Dodge, K. A., Lochman, J. E., Laird, R. D., & Conduct Problems Prevention Research Group. (1999). The distinction between beliefs legitimizing aggression and deviant processing of

social cues: Testing measurement validity and the hypothesis that biased processing mediates the effects of beliefs on aggression. Journal of Personality and Social Psychology, 77(1), 150–166. https://doi.org/10.1037/0022-3514.77.1.150